

## COMBRETACEAE IN NICARAGUA

Judith S. Hall and Frank C. Seymour<sup>2</sup>

The Combretaceae are the family selected by Judith S. Hall for taxonomic study in a graduate course in the University of Florida. The results of her study are published here as a part of the series in Phytologia by Frank C. Seymour on the flora of Nicaragua. By far the greater part of the text was written by Miss Hall. However, as the paper was not finished at the conclusion of the course, it has been completed by Mr. Seymour as joint author.

We wish to express our thanks to Dr. Willard W. Payne and to Dr. Daniel B. Ward and his staff for the use of the Herbarium of the University of Florida. Dr. Reed C. Rollins, Director of the Gray Herbarium, and Dr. Richard A. Howard, Director of the Arnold Arboretum, we thank for the privilege of examining specimens in their respective herbaria. We thank Mr. Ray Angelo for obtaining important information for us from the Harvard Herbaria. We are deeply indebted to the authors listed in the bibliography at the end of this article or cited in connection with a particular genus.

While this article deals primarily with the species known to occur in Nicaragua, other species of Central America are treated briefly, as some of them may at some time be found in Nicaragua.

### Description of the Combretaceae as a family.

Trees or shrubs or woody vines, often spiny. Leaves opposite or alternate or more than two at a node, simple, entire, on petioles; stipules none. Flowers in spikes or racemes, or rarely panicles or heads, terminal or axillary. Flowers usually perfect. Calyx adnate to ovary, 4-5-lobed (lobes persistent or deciduous). Petals none or 4-5, separate. Stamens 4-5 or 8-10, born on the calyx. Ovary 1-celled; ovules 6. Style and stigma simple. Fruit dry or fleshy.

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Artificial Key to the genera of Combretaceae.

1. Flowers minute, in dense globose, cone-like heads; leaves alternate . . . . . 2. Conocarpus L.
1. Flowers not in dense globose, cone-like heads but in spikes or racemes; leaves alternate or opposite
  2. Leaves alternate, crowded at tip of branches; petals none
    3. Pith hollow; calyx constricted above the ovary; fruit fleshy and a drupe; leaves not glossy, pointed at apex . . . . . 6. Terminalia L.
    3. Pith solid; leaves glossy, rounded at apex
      4. Calyx campanulate, shallowly 5-dentate; occasional spines on branches; fruit a fleshy drupe 5. Bucida L.
      4. Calyx shallowly cupuliform, lobes obsolete; spines none; fruit 5-ridged . . . . . 4. Buchenavia Eichl.
  2. Leaves opposite, not in whorls; petals 4-5
    5. Flowers and fruits sessile in elongate terminal spikes; fruit drupaceous, 1-1.5 cm in length, not angled or winged . . . . . 1. Laguncularia Gaertn. f.
    5. Flowers and fruit not sessile, on pedicels; fruit not drupaceous, with 4-6 wings or acute angles
      6. Calyx-tube above ovary long, slender, 8 cm long; vine . . . . . 3. Quisqualis L.
      6. Calyx-tube above ovary not long and slender, 3-10 mm in length; vine, tree or shrub . . . . . 7. Combretum L.

1. LAGUNCULARIA Gaertner f.

Small tree or shrub. Leaves opposite, petiolate. Flowers sessile, 5-merous, mostly perfect with occasional staminate flowers in terminal panicles. Calyx-tube turbinate. Petals 5, minute. Stamens 10, not exerted. Fruit sessile, longitudinally ribbed, drupaceous.

Two species in tropical America and Africa. Fl. Guatemala 7:276. 1972.

1. Laguncularia racemosa (L.) Gaertn. f. in Gaertn. Fruct. 3: 3:209. t. 217. 1805.

Conocarpus racemosa L. Syst. Nat. ed. 10:930. 1759.

Schousboea commutata Spreng. Syst. Veg. 332. 1825, nom. illeg.

Rhizaeris alba Raf. Sylv. Tellur. 90. 1838, nom. illegit.

Laguncularia obovata Mig. in Linnaea 18:752. 1844.

Shrub or small tree. Bark thin, reddish-brown. Leaves opposite, petiolate, petiole 1-1.5 cm. long, with two gland-dots at base, 3-7 cm. long. Flowers white or greenish-white, sessile, 5-merous, in terminal panicles; rachis densely appressed-pubescent.

escent. Petals 5, appressed-pubescent. Stamens 10, filaments very short. Style 1 mm. in length. Fruit drupaceous, 1.5 cm. long, reddish.

Common in mangrove-swamps from Mexico to Peru; British Honduras, Guatemala, Honduras, El Salvador, Costa Rica, Panama.

Nicaragua: Bluefields, Dept. Zelaya. Molina 2033 (GH).

## 2. CONOCARPUS L.

Shrub or tree, erect or prostrate. Leaves alternate, shortly petiolate, biglandular at the base. Flowers in minute, dense, globose, cone-like heads, sessile, 5-merous, perfect and staminate flowers in same inflorescence. Calyx-tube compressed. Petals none. Stamens 10, sometimes fewer. Ovary 1-celled. Style short. Ovules 2. Fruit small, angular, 1-seeded, aggregated into a cone-like mass.

Two species, often constituents of mangrove swamps.

### 1. Conocarpus erecta L. Sp. Pl. 176. 1753.

Conocarpus procumbens L. Sp. Pl. 177. 1753.

Conocarpus supinus Crantz, Inst. Rei Herb. 1:355. 1766.

Conocarpus acutifolius Humb. & Bonpl. ex Roem. & Schult. in Syst. Veg. 5:574. 1819.

Conocarpus erectus var. arboreus et procumbens DC. Prodr. 3: 16. 1828.

Conocarpus pubescens Schumach. in Kongel. Dansk. Vid. Selsk. Naturvid. & Math. Afh. 3:135. 1828.

Terminalia erecta (L.) Baill. Hist. Pl. 6:266, 275, fig. 240. 1877.

Shrub to tree, prostrate or erect. Leaves alternate, shortly petiolate or subsessile, petiole up to 4 mm. long. Blades with two gland dots near base, 11X3.5 cm. Flowers greenish-white, small, in dense heads 1 cm. thick, arranged in terminal racemes or born in the upper leaf-axils. Stamens normally 10, filaments 1.5-2 mm. long, anthers 0.5 mm. long. Style 2 mm. long. Fruits imbricated in a subglobose or cone-shaped structure, purplish-green.

Fruits superficially similar to those of Guazuma ulmifolia Lam. In Conocarpus erecta, leaves are glabrous or sericeous, entire, with faint nerves. In Guazuma ulmifolia, leaves are usually densely hairy beneath, serrate, with prominent nerves.

Mangrove swamps, Mexico, British Honduras, Panama.

Nicaragua:

Aserradores Is., Dept. Chinandega. Baker 2083 (GH).

Bluefields, Dept. Zelaya. Molina 1816 (GH).

Cardones (Cardenas) Is., Dept. Rivas. West 3565 (GH).

Masachapa, Dept. Managua. Seymour 1166 (BM, ENAG, F, GH, MICH, MO, MSC, NY, REED, SEYM, SMU, UC, VT, WDP).

Puerto Cabezas, Dept. Zelaya. Robbins 5950 (MO, SEYM).

Puerto Somoza, Dept. Leon. Marshall & Neill 6638 (BM, DUKE, ENAG, FLAS, GH, MO, NY, SEYM, SMU, UC).

### 3. QUISQUALIS L.

Woody vine with slender branches. Leaves opposite or subopposite. Flowers showy, in short axillary and terminal spikes or racemes. Calyx-tube ovoid below, produced above into a long slender tube, deciduous. Petals 5, obtuse. Stamens 10, exerted. Style filiform; ovules 3-4. Fruit dry, acutely 5-angled or 5-winged, 1-seeded.

About 17 species in tropical Asia and Africa, one of them widely cultivated for ornament. Fl. Guatemala 7:277. 1962.

#### 1. Quisqualis indica L. Sp. Pl. ed. 2:556. 1762.

Woody vine. Blades 14X5 cm., shortly petiolate, sparsely villos or almost glabrous. Spikes with conspicuous linear green bracts. Calyx-tube nearly 8 cm. long, very slender, finely pilose. Petals white, turning pink and red. Fruit ellipsoid, 5-winged.

The vine is not a common one in Central America. Fl. Guatemala 7:277. 1962.

### 4. BUCHENAVIA Eichl.

Trees or shrubs. Leaves alternate or in whorls. Flowers 5-merous, perfect and staminate together in elongated or axillary spikes. Petals absent. Stamens 10. Fruit fleshy, 5-ridged or 5-angled.

12-15 species, throughout tropical America. Fl. Panama 7: 159. 1958.

#### 1. Buchenavia capitata (Vahl) Eichl. in Flora 49:164. 1866.

Bucida capitata Vahl Eclog. Amer. 1:50, t. 8, fig. 1. 1796.  
Hudsonia arborea A. Robinson, ex Luman, Hist. Jam. 2:310. 1814.

Terminalia obovata Cambess. in St.-Hil. Juss. & Cambess., Fl. Bras. Merid. 2:241. 1829.

Terminalia bilariana Steud. Nomencl. Bot. 2:668. 1841.

Tree of about 8 meters. Branches tomentose when young,

soon glabrous. Leaves spirally arranged at tip of branches, petiolate or subsessile; petiole up to 6 mm. long. Blade 2-9 X 1-3.5 cm. Flowers 5-merous, sessile, in spikes. Peduncle 1.5-7 cm. long. Lower receptacle 1-3 mm. long, narrowed and slightly twisted at the apex. Filaments 2 mm long; anther 0.6 mm. long. Style 3.5 mm. long. Fruit greenish-yellow (black when dry), 5-ridged, hard and stony.

Panama to Bolivia and in the West Indies. Fl. Panama 7:159. 1958.

##### 5. BUCIDA L.

Trees with branches sometimes armed with paired gray spines. Leaves in whorls, crowded at the swollen apices of branchlets. Blades coriaceous, glabrous, obtuse or rounded at apex. Flowers perfect. Inflorescence spicate, axillary. Calyx campanulate; calyx-lobes shallowly dentate, persistent. Petals none. Filaments exerted. Fruit a fleshy drupe constricted at the apex.

Small genus with 3 or 4 more species, one in Mexico, the other in the West Indies and South America.

1. Petioles 2-10 mm. in length; branchlets occasionally armed with spines; blades 3-9 cm. in length, without gland dots at base . . . . . 1. Bucida buceras L.
1. Petioles 2-4.5 cm. in length; branchlets spineless; blades 12-25 cm. in length, with gland dots at base . . . . . 2. Bucida macrostachya Standley

1. Bucida buceras L. Syst. Nat. ed. 10. 1025. 1759.

Buceras bucidia Crantz, Inst. Rei Herb. 1:133. 1766.

Terminalia buceras (L.) Wright, in Suav. Fl. Cuba 38. 1868.

Myrobalanus buceras (L.) O. Kuntze, Rev. Gen. 237. 1891.

Medium sized tree, 9-20 meters high. Branches occasionally spiny with stout gray paired spines. Leaves clustered at end of short erect twigs, shortly petiolate; petiole 2-10 mm. in length. Blade 2-9 X 1-4 cm., pilose to glabrous, blunt or rounded at apex, narrowed at base with two not always conspicuous glands. Flowers small, greenish-white or light-brown, stalkless in lateral clusters 2-8 cm. in length. Rachis appressed-pubescent. Stamens 10; filaments 4 mm. in length; anther 1 mm. in length. Style 3.5 mm. in length. Fruit brownish, conical, about 8 mm. in length, with densely appressed pubescence.

Frequently in coastal seamps, mangrove association; cultivated in Florida.

Southern Florida, West Indies, Mexico, British Honduras, Guatemala, Nicaragua (specimen not seen), Costa Rica, Panama.

2. Bucida macrostachya Standley, Field Mus. Bot. 4:240. 1929.

Tree, 5-9 meters. Petioles mostly 2-4.5 cm. in length. Blades 12-25 cm. in length, glabrous or sparsely pilose on nerves, densely whitish-puncticulate, below entirely pilose. Spikes numerous, densely flowered; flowers green or whitish; inflorescence densely tomentose. Calyx persistent after anthesis, broadly campanulate. Fruit ovoid, 5-6 mm. long, Anthers exerted.

Dry rocky hills. Southern Mexico, Guatemala, Honduras, Nicaragua (specimen not seen).

6. TERMINALIA L.

Trees of large size. Leaves spirally arranged, often crowded at apex of branchlets, mostly petiolate, often minutely verruculose, with glands at base. Flowers 5-merous (occasionally 4-merous), in terminal and axillary spikes, both staminate and perfect flowers on spikes, or all perfect. Calyx-tube ovoid, constricted above the ovary. Petals absent. Stamens 10; filaments exerted; anthers dorsifixed. Style simple; ovary inferior; ovules 2. Fruit dry or drupaceous, often winged.

About 200 species distributed throughout the tropics.

- 1. Fruit not winged; blades 10-30 cm. long . . . 3. T. catappa L.
- 1. Fruit winged; blades 6-15 cm. long.
  - 2. Leaf undersides glabrous; flowers unknown . . . . .
  - 2. Leaf undersides pilose; flowers on spikes.
    - 3. Fruit 4-5 mm. in length; blades with 2 marginal gland dots above base on lower surface.
      - 4. Leaves cuneate-attenuate at base . . . . .
        - 1. T. amazonia (J. F. Gmel.) Exell
      - 4. Leaves obtuse at base . . . . .
        - 2. T. myriocarpa Van Heurck & Muell. Arg.
    - 3. Fruit 2-3.5 cm. long; leaves usually without gland dots.
      - 5. Young blade brownish-pilose on lower surface or glabrate; veins elevated and reticulate especially beneath; fruit 3-3.5 cm. long . . . 4. T. nyssaeifolia Britton
      - 5. Young blade almost glabrous on lower surface; veins not elevated, not reticulate; fruit at most 2 cm. long . . . . . 5. T. oblonga (R. & P.) Steud.

1. Terminalia amazonia (J. F. Gmel.) Exell. in Pulle, Fl. Surin. 3:173. 1935.

Chuncoa amazonia J. F. Gmel. in L. Syst. Nat. 2:702. 1791.  
Gimbernatea obovata Ruiz & Pav., Fl. Peruv. Chil. Prodr. 138. 1794.

Chuncoa obovata (Ruiz & Pav.) Pers. Syn. 1:486. 1805.  
Chuncoa obovata (Ruiz & Pav.) Poir. in Encycl. Meth. Bot., Suppl. 2:258. 1811.

Terminalia obovata (Ruiz & Pav.) Steud. Nomencl. Bot. 2:668. 1841, non T. obovata Cambess. 1829.

Terminalia odontoptera Heurck & Muell, Arg. Obs. Bot. 217. 1870.

Terminalia excelsa Liebm. ex Hemsl. Biol. Centr. Amer. Bot. 1:402. 1880.

Myrobalanus obovata (Ruiz & Pav.) O. Kuntze, Rev. Gen. 237. 1891.

Terminalia hayesii Pittier, in Contrib. U. S. Nat. Herb. 18:239. 1917.

Large tree up to 40 meters high. Bark smooth, peeling off easily in sheets. Young branches densely pilose with appressed yellowish or brownish hairs. Leaves arranged in a whorl at the ends of the branches, petiolate; petiole 1-10 mm. long. Blade 5-10 X 3.5 cm., usually with two glands. Flowers white, cream or yellowish-green, 5-merous, sessile, in axillary spikes. Stamens 10; filaments 1.8-2 mm. long. Fruit 5 X 10 mm., 5-winged.

Common along the Atlantic Coast of Central America. Found in swamps and on hillsides.

Southern Mexico, British Honduras, Guatemala, Nicaragua, south to Panama, Brazil and Peru.

Nicaragua: Siuna-Limbaika, Dept. Zelaya. Seymour 4983  
 (ENAG, GH, MO, SEYM).

2. Terminalia myriocarpa Heurck & Muell. Arg., Obs. Bot. 215-217. 1870.

Excerpts translated from original description.  
 Leaves opposite or subopposite, short-petioled, sub lanceolate, acute, obtuse at base, pubescent,... 2 large cyathiform glands at base.... Spikes paniculate, branched, minutely tomentose... Flowers strongly sessile. Calyx campanulate-ovoid, 5-lobed to the middle, outside glabrous, inside appressed-hirsute; lobes triangular-ovate, subacute, erect.... Fruit 5-winged, pubescent, the 2 anterior and one posterior (wings) small or sometimes ob-

solete, lateral ones equal, twice as wide as long, slender, glabrous.

Occurs in East India, prov. Khasia. Reported in Panama.

3. Terminalia catappa L. Mant. Pl. 128. 1767.

Tree 25 meters high. Branches few, spreading. Leaves clustered at end of branches, 10-30 cm. in length, pointed at apex, almost glabrous. Flowers in spikes 5-15 cm. long, green. Fruit a woody drupe, 2-edged, 4-7 cm. long, the seed 3-4 cm. in length.

Lowlands near coast. Well known throughout the lowlands of Central America.

Guatemala, Nicaragua, Costa Rica.

Nicaragua:

Aserradores Is., Dept. Chinandega, Baker 2084 (GH).

Puerto Cabezas, Dept. Zelaya. Robbins 5928 (BM, ENAG, GH, MICH, MO, NY, SEYM, SMU, UC, WDP).

Siuna, Dept. Zelaya. Seymour 5023 (BM, ENAG, F, FLAS, GH, MICH, MO, NY, SEYM, SMU, UC, WDP).

El Viejo, Dept. Chinandega. Atwood 2641' (BM, ENAG, F, GH, MICH, MO, NY, SEYM, SMU, UC, WDP).

4. Terminalia nyssaeifolia Britton, Bull. Torr. Bot. Club 48:333. 1922.

Tree of 20 meters or so. Leaves short-petiolate, 7-12 X 4-6 cm., green on upper surface, paler with pilose hairs below when young, becoming glabrous with age; veins elevated. Flowers spicate, densely brown-pilose; flowers few. Fruit glabrous, 3-3.5 cm. in length; wings thick and hard.

The occurrence of this tree at this one isolated spot in Central America is curious and not a natural extension of range for a Trinidad tree, although well within the bounds of possibility.

Fl. Guatemala 7:281. 1962.

5. Terminalia oblonga (Ruiz & Pav.) Steud. Nom. Bot. 2:668. 1841.

Gimbernacia oblonga Ruiz & Pavon, Syst. Veg. 274. 1798.

Chuncoa oblonga Pers. Sun. Pl. 1:486. 1805.

Terminalia chiriquensis Pittier, Contr. U. S. Nat. Herb. 18:238. 1917.

Large tree similar to T. amazonica, sometimes 45 meters tall.

Bark mottled. Leaves on longer petioles than T. amazonia, almost glabrous, without glands. Flowers green; spikes longer than leaves. Stamens exerted. Fruit with two wings; wings finely nerved.

Common in lowland forests. Guatemala and El Salvador to Panama and Brazil.

Nicaragua: Area de Ocotal, Dept. Nueva Segovia. Molina 2345 (GH).

6. Terminalia bucidoides Standley & L. Wms., Ceiba 3:214.  
1953.

Tree up to 15 meters tall. New branches glabrous. Leaves on young branches about 9-13, oblanceolate, acute or short acuminate, at base cuneate, glabrous, 4-13 cm. long, 1.5-4.5 cm. wide, nerves 5-8, prominent; petioles 1-3 cm. long. Inflorescence terminal or subterminal. Flowers unknown. Fruit strongly 2-winged, wings 1-2 rudimentary sometimes added, 17-25 mm high 13-22 mm. wide, slender and coriaceous. Translated from original description. Nicaragua and Costa Rica.

Nicaragua: Esquipulas y Aleman mountains, drainage of Rio Alaman, Dept. Zelaya, alt. 150 m. Shank & Molina 4839 (GH). TYPE.

7. COMBRETUM L.

Woody vine. Leaves petiolate. Flowers 4-merous or 5-merous; rachis pubescent to scaly. Calyx campanulate, 4(5)-lobate, deciduous. Petals 4(5), glabrous to hairy. Stamens 8-10; filaments 3-3.5 mm. in length. Ovules 2-6. Fruit with 4-6 wings or angles, 1-seeded, the wings membranous.

Species about 350, in most tropical and subtropical regions of the world. Fl. Guatemala 7:271. 1962. Seven species in Central America.

1. Leaf-blade without scales, hairs only on the midrib on upper surface.

2. Flowers 5-merous.

3. Branches spiny; leaf arrangement alternate or subopposite; petiole 2-5 mm. in length.

4. Lower leaf surface pilose; style 5.5 mm. in length; flowers sessile; ovary appressed-hairy, scarcely narrowed at apex . . . . . 6. C. spinosum Bonpl.

4. Lower leaf surface glabrous except midribs and veins pilose; style 0.4 mm. in length; flowers almost sessile or on short pedicels; ovary glabrous, narrowed at apex . . . . . 3. C. decandrum Jacq.

3. Branches spineless; leaf arrangement opposite; petiole 6-8 mm. in length . . . . . 2. C. cacoucia Exell
2. Flowers 4-merous.
5. Blade undersides glabrous except sparsely hairy on mid-rib and veins; petiole 2-7 mm. in length; filaments 4 mm. in length . . . . . 5. C. laxum Jacq.
5. Blade undersides minutely scaly to densely brownish scaly or puberulent on nerves; petiole 5-10 mm. in length.
6. Calyx-lobes 4-5 mm. in length; petals 4-5 mm in length; blades 11-18 cm. in length; petioles scaly; filaments 25-35 mm. in length . . . . . 7. C. sambuense Pittier
6. Calyx-lobes 0.8-0.9 mm. in length; petals 1.8 mm. in length; blades 7 cm. in length; petioles appressed-hairy; filaments 2-3 mm in length . . . . . 8. C. rovirosae Exell
1. Leaf blade with scales and without hairs on upper surface.
7. Rachis densely pilose with short spreading yellowish hairs; fruit pilose; undersides of blades yellowish-scaly; petals hairy . . . . . 1. C. argenteum Bertol.
7. Rachis scaly; fruit scaly; undersides of blades densely yellowish-red to brownish-scaly; petals usually glabrous . . . . . 4. C. fruticosum (Loefl.) Stuntz

1. Combretem argenteum Bertol. Fl. Guatemala 412. 1840.

Combretem erianthum Benth. Pl. Hartw. 73. 1841.

Large trailing vine. Petioles 1-7.2 cm. in length, whitish. Blades 10-15 X 2.5-5.5 cm., glabrous above, yellowish-scaly with pilose hairs on lower surface, acute or acuminate, rounded-obtuse at base. Inflorescence simple or sparingly branched, often forming large panicles. Rachis densely pilose with short spreading yellowish hairs. Flowers yellowish-green to bright-yellow. Calyx-tube scaly, white; lobes deltoid. Petals glabrous, equaling the calyx-lobes. Fruit 2 cm. long, usually crimson at maturity. Fl. Guatemala 7:272. 1962.

Moist or dry thickets. Mexico, Guatemala, Honduras, El Salvador, Nicaragua (specimen not seen).

2. Combretem cacoucia Exell in Sandwith, Kew Bull. 1931:469. 1931.

Cacoucia coccinea Aubl. Pl. Guian. 450, t. 179. 1775.

Schousbuea coccinea (Aubl.) Willd. in L. Sp. Pl. 2:578. 1779.

Combretum coccineum Engl. & Diels in Engler, Monogr. Afr.

Pflanzenfam. 3:110, 112. 1899, not Lam. 1785.

Terminalia Cacoucia Baill. Hist. Pl. 6:275. 1877, nom. illegit.

Large vine or shrub. Branches pubescent. Petioles 5-8 mm. in length. Blades 20 X 10 cm., acute or acuminate at apex, cordate at base, almost glabrous except pilose on upper midrib. Flowers red, in dense terminal and axillary spikes 50 cm. in length, with bracts 3-5 mm. in length. Calyx 5-lobate. Petals exceeding the calyx-lobes. Stamens 10, exerted; filaments 20 mm. in length; anthers 1.2-1.5 mm. in length. Style 25 mm. in length. Fruit 5-angulate, not winged, 6 X 2 cm.

Wet thickets, usually in swamps. British Honduras, Guatemala, Honduras (GH), Nicaragua, Panama, southward to Brazil. Fl. Guatemala 7:272. 1962.

3. Combretum decandrum Jacq. Enum. 19. 1760.

Combretum Palmeri Rose, Contr. U. S. Nat. Herb. 5:136. 1897.

Combretum nicoyanum Pittier, Contr. U. S. Nat. Herb. 17:247. 1917.

Large vine. Branches pubescent or glabrous, with spines. Leaves alternate-opposite, glabrous above, with pilose hairs beneath along midrib and nerve-axils; blades 5-14 X 3-7.5 cm. Flowers 5-merous, white, in terminal panicles, almost sessile or on short pedicels; rachis tomentose to glabrous. Calyx-lobes 5, deltoid, about 0.5 mm. in length, glabrous or hairy at base; hypanthium glabrous or hairy. Petals 5, 2-3 X 1.5 mm., hairy. Stamens 10, 3-5 mm. in length; filaments 0.4 mm. in length. Style 4 mm. in length. Ovary glabrous to spreading-hairy, narrowed at apex. Fruit 5-winged, 5-6 mm. broad.

Dry or wet thickets from Mexico to Colombia.

4. Combretum fruiticosum (Loefl.) Stuntz, U. S. Dept. Agr. Bur. Pl. Ind. Seed & Pl. Imp. No. 31:86. 1914.

Gaura fruticosa Loefl. Inter Hispan. 248. 1758.

Combretum secundum Jacq. Enum. 19. 1760.

Combretum farinosum HBK. Nov. Gen. & Sp. 6:110. 1823.

Combretum formosum Don in Trans. Linn. Soc. Lond. 5:420. 1827.

Combretum micropetalum DC. Prodr. 3:19. 1828.

Combretum aurantiacum Benth in Hooker Lond. Jour. Bot. 2: 222. 1840.

Combretum Benthamianum Van Heurck & Muell. Arg. in Van

Heurck, Obs. Bot. 220. 1871.

Combretum Warszewiczia.num Eichler in Mart. Fl. Bras. 12,  
pt. 2:110. 1867.

Combretum farinosum var. phaenopetalum Donn. Sm. Bot. Gaz.  
23:7. 1897.

Combretum phaenopetalum (J. D. Sm.) Pittier, Contr. U. S.  
Nat. Herb. 18:243. 1917.

Combretum polystachyum Pittier, Contr. U. S. Nat. Herb. 18:  
243. 1917.

Combretum lepidopetalum Pittier, Contr. U. S. Nat. Herb. 18:  
245. 1917.

Combretum multidiscum Rusby, Descr. New Sp. S. Amer. Pl.  
69. 1920.

Combretum Loeflingii subsp. ornithophilum Suesseng. in Mitteil  
Bot. Staatssamml. Munch. 14. 1950.

Shrub or vine, without spines. Blades 5-12 X 3-7 cm., scaly  
to glabrous on upper surface, densely scaly below. Petiole 7-10  
mm. in length. Flowers on thick spikes, dense, sessile, red-  
orange. Petals 1-1.5 mm. in length, yellow. Stamens 8, 15-20  
mm. in length; anthers 1 mm in length, exceeding the calyx.  
Style 15-20 mm. long. Fruit 2 cm. long, densely scaly, broadly  
winged, dark-red.

Dry or wet thickets. Mexico, British Honduras, Guatemala,  
Honduras, El Salvador, Nicaragua, Costa Rica, Panama.

Nicaragua:

Isabel, Rio Grande, Dept. Zelaya. Molina 2488 (GH).

La Cruz, Dept. Jinotega. Molina 2388 (GH).

Limbaika, Dept. Zelaya. Seymour 4931 (MO, SEYM), 4932  
(BM, ENAG, FLAS, GH, MO, NY, SEYM, SMU, UC).

Madregara, Dept. Zelaya. Seymour 3271 (ENAG, GH, MO,  
SEYM, SMU).

Juigalpa, Dept. Chontales. Moore 1627 (MO, SEYM).

El Realejo, Dept. Chinandega. Baker 2088 (GH).

Siuna, Dept. Zelaya. Seymour & Atwood 3271 (GH).

Volcan Cosiguina, Dept. Chinandega. Seymour 7094 (B, GH,  
MO, SEYM, SMU).

Volcan Mombacho, Dept. Granada. Dudey, Moore & Nichols  
1951 (BM, ENAG, F, GH, MO, MSC, NY, SEYM, UC, WDP).  
Without definite locality. Wright (GH).

5. Combretum laxum Jacq. Enum. Pl. Carib. 19. 1760.

Combretum puberum Rich. in Act. Soc. Hist. Nat. Par. 1:108.  
1792.

- Combretum mexicanum Humb. & Bonpl. Pl. Aequin. 2:159, t. 132. 1809.
- Combretum cordatum Don, in Trans. Linn. Soc. Lond. 15:420. 1827.
- Combretum ferrugineum Don, Trans. Linn. Soc. Lond. 15:430. 1827.
- Combretum bugi Cambess. in St. Hil. Juss, & Cambess. Fl. Bras. Merid. 2:247, t. 130. 1829.
- Combretum adenophyllum Mart. in Fl. 24:Be; bl. 2:1. 1841.
- Combretum jacquinii Griseb. Fl. Brit. W. Ind. 275. 1860.
- Combretum accedens Heurck & Muell. Arg. in Heurck, Obs. Bot. 234. 1870.
- Combretum epiphyticum Pittier, Contr. U. S. Nat. Herb. 17: 247. 1917.
- Combretum brunnescens Gleason, in Bull. Torr. Bot. Club 53: 291. 1920.
- Combretum marchii Fawc. & Rendle in Jour. Bot. 63:115. 1925.

Large vine. Blades 11-20 cm. in length, glabrous above, sparsely hairy on midrib and veins below. Petiole 2-7 mm. in length. Flowers creamy-white, 4-merous, sessile on large panicles. Calyx finely pubescent, 1-1.5 mm. in length; lobes deltoid. Petals slightly exceeding the calyx-lobes. Stamens 8 exerted; filaments 4 mm. in length; anthers 0.5 mm. long. Style 2.5-4 mm in length. Fruit 2 cm. long, reddish-green or dark-red.

Wet forests or thickets, mangrove-swamps. Mexico, British Honduras to Panama, West Indies, southward to Argentina.

Nicaragua:

Bluefields, Dept. Zelaya, Molina 1799, 2098 (GH).

Brenales espesos de La Esperanza, Rio Grande, Dept. Zelaya. Molina 2120 (GH).

Drenajes de los Rios Punta Gorda, Cano Chiquito, Dept. Zelaya.

Shank & Molina 5000 (GH).

Without definite locality. Wright (GH).

6. Combretum sambuense Pittier, Contr. U. S. Nat. Herb. 18: 242. 1917.

Woody vine. Petioles 5-10 mm. long, scaly. Blades ovate to broadly elliptic, 11-18 X 5.5-9.5 cm., glabrous, with golden-yellow scales beneath. Flowers reddish or purplish, 4-merous, sessile, in terminal panicles of spikes and lateral axillary spikes. Axis with dense rufous scales. Calyx-lobes 4-5 mm. long. Petals yellow, 4-5 mm. long. Stamens 8; filaments 25-35 mm. long. Fruit crimson, almost spherical, 1.8-2.5 cm. thick, scaly, min-

utely hairy.

Known in Panama, only.

7. Combretum spinosum Bonpl., Pl. Aequinox. 2:161. 1809.

Combretum guayea Humb., Rel. Hist. 3:3. 1825, nom. nud.

Poivrea eriopetala DC., Prodr. 3:18. 1828.

Combretum eriopetalum (DC.) Don, Gen. Syst. 2:665. 1832.

Combretum punctulatum Pittier, Contr. U. S. Nat. Herb. 18: 248. 1917.

This species is very similar to Combretum decandrum Jacq., perhaps the same. But flowers sessile. Ovary appressed-hairy, scarcely narrowed at apex.

Panama, Venezuela, West Indies.

8. Combretum rovirosae Exell, Jour. Linn. Soc. 55:134, fig. 5e.

Shrub. Petioles 10 mm. long, appressed-hairy, bearing spine at base. Blades elliptic, acute at tip and base, 7 cm. in length, 3.5 cm. in width, above glabrous, below minutely scaly and on nerves puberulent, otherwise glabrous; lateral nerves on each side 6-8. Flowers small, 4-merous, sessile, in long paniculate spikes. Calyx-lobes deltoid 0.8 X 0.9 mm. Calyx-lobes and hypanthium densely hairy. Petals obovate-spatulate, 1.8 X 1.2 mm., silky-tomentose. Stamens exerted; filaments 2-3 mm. in length. Style exerted, 3 mm. in length. Fruit unknown. Translated from original description.

Mexico and Honduras.

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